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ABSTRACT

A description of the evaluation plan used in the Reading Improvement Project in Cleveland's target Title I elementary schools is presented. The plan's formation was influenced by two guidelines: (1) the necessity of providing for procedures to overcome threats to the validity of the findings so that some sound assessment of program effects could be made and (2) a desire to remain sensitive and responsive to realities of the school worlds involved--particularly concerns of pupils and staff participating in the project. Three of the critical issues encountered, among many, and the solutions found for them are given. The issues were (1) random assignment of pupils to project services, (2) choice of a model of analysis appropriate to the program's data collection procedures, and (3) the determination of whether or not experimental and control pupils received significantly different final reading marks from their classroom teachers. Covariates and dependent variables used as factors in the evaluation are listed. (Author/NH)

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AN APPROACH TO EVALUATION OF A READING PROGRAM IN THE PUBLIC SCHOOL SETTING

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Margaret Fleming

Evaluation of the Reading Improvement Project in Cleveland's target Title I elementary schools might be described as having evolved through a unique combination of circumstance and deliberate design. Two guidelines influenced formulation of the evaluation plan--first, the necessity to provide for procedures to overcome threats to validity of the findings so that some sound assessment of program effects could be made; and second, a desire to remain sensitive and responsive to realities of the school worlds involved--particularly concerns of pupils and staff participating in the project.

This discussion centers on three from among several critical issues encountered. It reports the solutions attempted in structuring a sound evaluation plan to operate within the setting of the inner-city public school.

The first issue focused on random assignment of pupils to project services.

The problem was of concern because evaluation standards necessitated control, and yet the intent of Title I legislation, as you know, as well as our own commitment in Cleveland as educators, would not permit denial of service to youngsters in need, just to satisfy an evaluation plan. It was recognized that public schools do not exist primarily for the support and proliferation of evaluation schemes.

Fate, perhaps, had a hand because identification of pupils according to program criteria produced a much larger population than could be accommodated by program resources. Approximately 800 places

RE002 725

were available, and almost 1,600 pupils met the criteria in the primary grades throughout the 21 target schools.

Random assignment, therefore, provided a fairer solution than otherwise would have been possible for the question of who shall be served when so many have been identified. It ensured as well an experimental-control framework for assessment of effects.

Random assignment had another important contribution to the program. The schools involved in the project have mobility rates ranging from about 25 to almost 100 per cent. Pupils in these schools can be anticipated to move in and out during the course of a program. Random assignment was a means for providing for systematic replacement as places would become available in service groups.

This replacement was done at four entry points during the year. It helped to clarify for school and program administrators the issue of relationship between term of program service and level of improvement in reading performance.

For example, grade 3 pupils assigned in September gained an average of 1.1 grade equivalent units in comprehension. This gain was twice the average gain observed for pupils assigned in the February period, which was .54 grade equivalent units.

A second issue involved choice of a model of analysis appropriate to the program's data collection procedures--now that random assignment could be employed. Our questions of interest required measurement of an array of variables related to reading performance. It was important, for example, that not only scores on standardized reading tests of vocabulary and comprehension be compared for experimental and control groups, but that observations be assembled about the relationships between

attendance and poverty level of pupils and their reading performance.

Another critical area of interest was the determination of whether or not experimental and control pupils received significantly different final reading marks from their classroom teachers. It was also considered important that consideration be given in the evaluation plan to differences in the classroom teachers' ratings of experimental and control pupils' performance in classroom reading groups, their confidence, adjustment to school, attitude toward school, and attitude toward reading.

As can be seen from this slide, from the evaluation needs, there emerged three variables which would function as co-variates--scholastic apitude test score, poverty index, and attendance.

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Ten variables emerged as the dependent factors in the evaluation plan. This slide indicates these variables included: Vocabulary test score, comprehension test score, final mark in reading, ratings of classroom reading performance, work in reading group, written work, pupil confidence, school adjustment, attitude toward school and attitude toward reading.

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Slide 2 here

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This data just described were cast into a 2 x 3 x 2 model involving the factors: sex, grade, and experimental-control. This slide shows the model with a total of 252 cases allotted disproprotionately across 12 subclasses.

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It was apparent that an appropriate analysis procedure for this evaluation would have to take into account the dependencies existing between the variables described. It was also necessary to provide a solution for disproportionate subclass numbers which occur with frequency in data from the real world. Finally, it should be a technique which could deal with correlation between the variables involved.

It was also apparent that univariate analysis procedures could not deal with correlations between all of the variables involved in this program; nor could these procedures produce independent statistical tests. Multivariate analysis of covariance was selected, therefore, as the appropriate procedure.

The multivariate approach would use a single probability statement applicable to all variables jointly and would be based upon a known sampling distribution from which required probabilities could be obtained. It would allow for inspection of the differences between treatment effects, so that the direction and relative size of effect on each of the dependent variables could be determined. After test of main effects of variables under this procedure, step-down tests would permit investigation of dependent variables in an ordering chosed by the investigator.

Results of the multivariate test indicated that the Reading Improvement Program produced a significant upgrading of reading performance for experimental children. In all grades, experimental children reflected superior reading performance to that observed for their controls in terms of vocabulary and comprehension test scores.

For boy and girl contrasts, the multivariate test indicated no differences for any of the dependent variables.

In terms of grade level contrasts, the multivariate tests revealed that the greatest impact of the program took place at grade 3 where reading comprehension performance, school adjustment and final reading mark were significantly higher for grade 3 experimental pupils than all other pupils.

Teachers were shown to have given significantly higher classroom reading performance ratings to grade 1 pupils, while grade 2 pupils reflected highest reading attitude ratings of all the grade levels.

It was found, also, that final marks in reading given by the classroom teachers were negatively correlated with performance on the vocabulary and comprehension tests. Other ratings given by the classroom teachers to both control and experimental children were also found to be inversely related to results on the standardized tests. Correlations between the teachers' ratings spread across a wide range with a top positive correlation of .58 to a low negative correlation of .11. It had been anticipated that there would be a positive relationship between teacher ratings in these areas rather than the wide range observed. This finding suggests in-service needs for teachers in identifying appropriate and inappropriate pupil behaviors.

A third issue centered on the structuring of program goals so that expectations of what pupils should and could do because of treatment would be more specifically identified. Establishment of individualized goals came through the use of a reading formula of expectancy, the Bond-Tinker method.

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Slide 4 here
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As can be seen from the slide, the Bond-Tinker formula generates a reading expectancy expressed in grade equivalent units by using the

product obtained from multiplying the pupil's years in school (beyond kindergarten, that is) by the I.Q. score divided by 100, to which is added a constant of 1.00 to reflect the pupil's grade equivalent score of 1.0 when he begins the first grade.

Typical goals for reading programs usually state something to the effect that children served in general will gain a year in achievement as measured by standardized reading tests. Such a gross goal was considered inappropriate and insensitive to what the Reading Program was attempting to accomplish. Individualized goals which established each pupil's expectancy took into account the present condition of the pupil as well as what would be the probable development of his reading skill.

It has been demonstrated that the Bond-Tinker method identifies greater discrepancies between reading level and expectancy for under-achieving pupils who fall in the below-average range of scholastic ability. This tendency of the formula was considered appropriate because expectations should be raised for this group of pupils who were probably actually performing in such a state because of their reading problems.

The final step in individualizing goals included the addition of a criterion. The criterion stipulated that a dimension of tolerable performance would be allowed. It would be within a half-year of the pupil's reading expectancy, using a grade placement score. This was considered an appropriate performance interval for the primary grade pupil.

The goal for each pupil then became:

> To improve reading performance of educationally deprived pupils by bringing them up to a level appropriate for their reading expectancy which shall be determined by the Bond-Tinker formula; the appropriate level being described as within one

half-year of the reading expectancy in terms of grade equivalent score units.

The use of a reading expectancy for pupils provided an additional evaluation dimension for assessing projects effects by facilitating an individual-vs-self comparison within an overall plan of experimental-control contrasts. Frequently, reading improvement programs look only to the advantage anticipated in experimental-control contrasts rather than a concern that pupils served actually will perform at an improved level geared to their probable reading growth.

As can be seen from this slide, grade 2 pupils moved upward toward their reading expectancies. Forty per cent attained the criterion level of within at least a half-year of their expectancies, while another 38 per cent fell within a year to .6 of a year of their expectancies. Fifty per cent had began the program 1.1 of year to 1.5 year below their expectancies.

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Slide 5 here
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In summary, this approach to an evaluation of reading project in the inner city school provided hopefully a sensitive heart to rigorous procedures, nonetheless overcoming the threats to valid inference about the effects of the program. Not to be overlooked, however, is the fact that contrary to the findings of Title I programs, which have been put with one fell swoop by some commentators into ineffective expenditures of time and money, the Reading Improvement Program appears to have accomplished what is said it would.

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Minneapolis, Minnesota

Slide 1

READING IMPROVEMENT PROGRAM

INDEPENDENT VARIABLES RELATED TO READING PERFORMANCE

(Co-variates)

POVERTY INDEX

SCHOLASTIC APTITUDE TEST SCORE

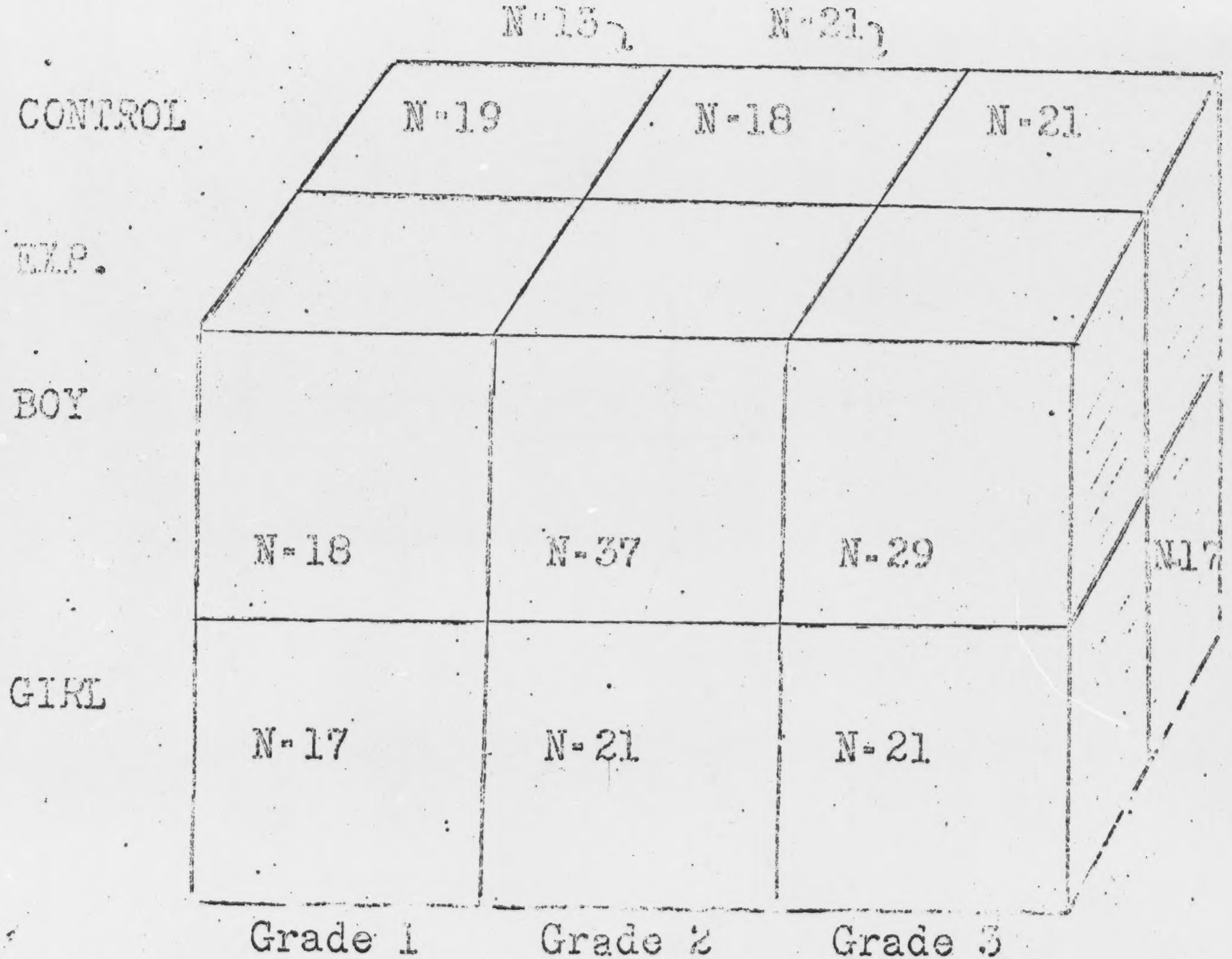
ATTENDANCE

Slide 2

READING IMPROVEMENT PROGRAM

DEPENDENT VARIABLES RELATED TO READING PERFORMANCE

1. Vocabulary Test Score
2. Comprehension Test Score
3. Final Mark in Reading
4. Rating of Classroom Reading Performance
5. Rating of Work in Reading Group
6. Rating of Written Work
7. Rating of Pupil Confidence
8. Rating of School Adjustment
9. Rating of Attitude Toward School
10. Rating of Attitude Toward Reading


N-18
N-21
CONTROL
N-19
N-18
N-21
E.P.
BOY
N-18
N-37
N-29
N17
GIRL
N-17
N-21
N-21
Grade 1
Grade 2
Grade 3

Slide 4

BOND-TINKER FORMULA FOR READING EXPECTANCY

$$\frac{\text{Years in School}}{} \times \frac{\text{I. Q. Score}}{\div\ 100} + 1.00 = \text{READING EXPECTANCY}$$

Slide 5

PERCENTAGES OF PUPILS AT VARIOUS PERFORMANCE LEVELS COMPARED WITH READING EXPECTANCIES

Grade 2